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SUPERVISED MACHINE LEARNING: REGRESSION AND CLASSIFICATION

MACHINE LEARNING SPECIALIZATION

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MACHINE LEARNING

- **Machine Learning (ML)** is the process of learning from data without explicit programming.
- Machine Learning algorithms learn from data through finding pattern and analysis
- Higher the amount of data the better is the performance
- **Types of ML**: Supervised Learning, Unsupervised Learning, Reinforcement Learning
- **Supervised Learning**: Learn from **labeled** input data, **EX**: Spam filtering, Speech recognition, Machine translation, Online advertisement, Automation
- **Regression** and **Classification** are Supervised Learning applications
- **Regression** predicts numeric value such as price of the house from size of house as input data
- **Classification** categorizes data into N small number of possible classes through decision boundary where input data is multidimensional, **EX**: Classify if image is a cat image

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MACHINE LEARNING

- Unsupervised Learning: Identify pattern, insight and structure from unlabeled input data. EX: Clustering, Anomaly Detection, Dimensionality Reduction, Market Segmentation
- Clustering groups unlabeled data into clusters based on properties, EX: Google News, DNA Gene Micro Array, Customer Grouping
- Anomaly Detection finds fraud transaction in credit card, fault in manufacture components
- Dimensionality Reduction compress the data for easy store and process for analysis
- Market Segmentation groups similar customers together based on property
- Linear Regression model fit straight line to estimate numeric value such as housing price
- Classification model predict category from N possible classes such as disease classification
- Input data X is called feature and output data Y is called target variable
- X fed into learning algorithm predicts y based on Hypothesis F(X)